

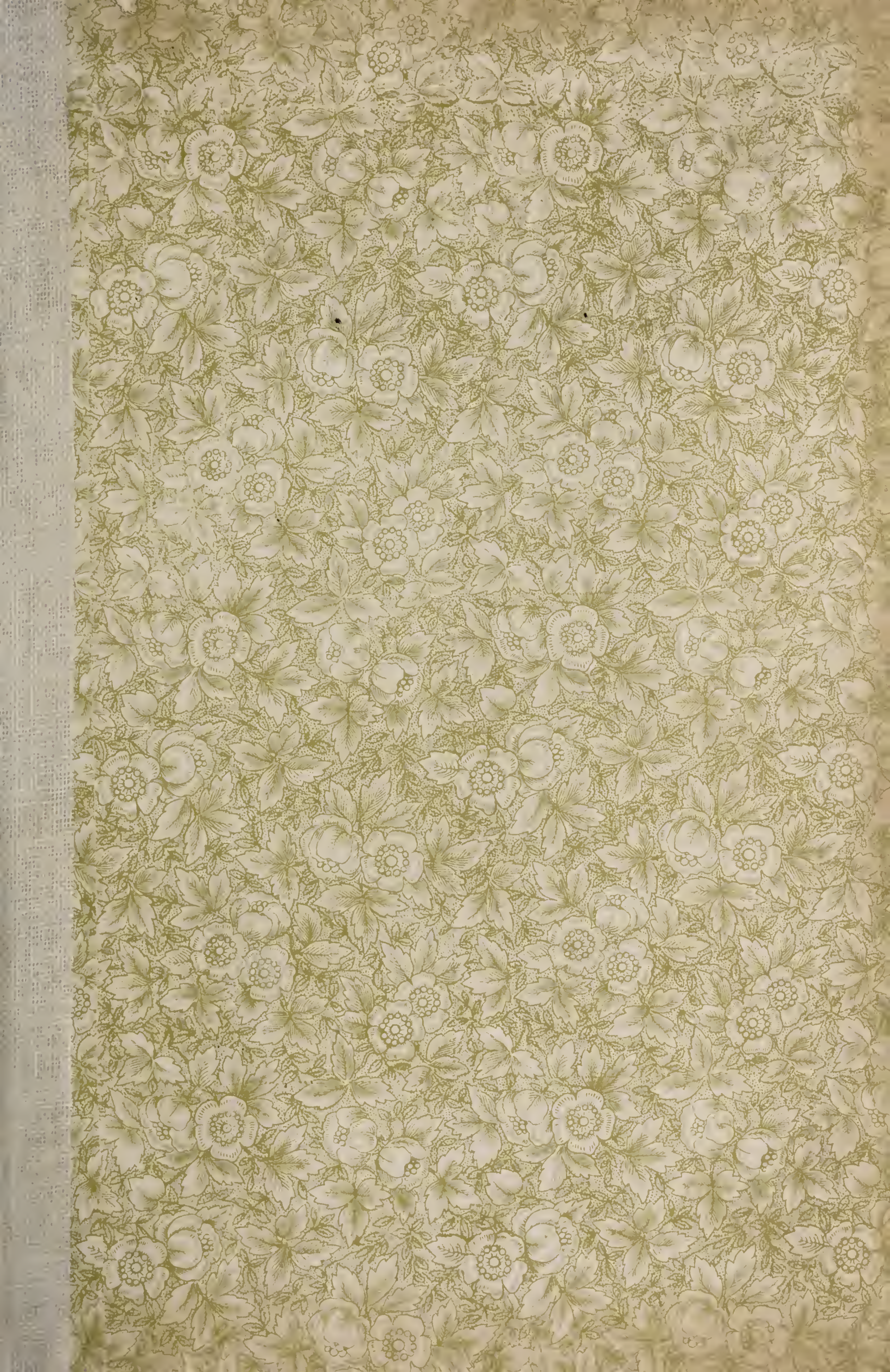
SINKING FUND
AND
INSTALMENT
TABLES

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SINKING FUND TABLES

AND

INSTALMENT TABLES,

BY

WILLIAM POWIS, F.C.A.

WITH

EXTRACTS FROM A PAPER

ON

MUNICIPAL FINANCES AND ACCOUNTS

READ BY THE AUTHOR BEFORE THE INSTITUTE OF CHARTERED ACCOUNTANTS,

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MUNICIPAL FINANCES AND ACCOUNTS

MANAGEMENT.

In the management of municipal affairs, there should be (tempered with prudence and caution) a bold and comprehensive policy pursued; in each case, looking to the welfare of the whole municipal community, in the future as well as the present.

DEBENTURES.

A very important matter in the management of municipal affairs, is the governing of the debenture debt; both as regards its amount and maturity, and the value and durability of what has been procured thereby.

DEBT.—It is often wiser and more economical, to incur a large debt for durable works of great utility, than to keep down the debt at the sacrifice of other important considerations. At the same time, while judicious expenditure, that can only be accomplished by borrowing, is commendable, the amount of debt should be watched and adjusted so that it may not grow beyond the limits of prudence or justice.

POWERS.—When debentures are issued, they should never be made payable at a date beyond the time when the works thus paid for are expected to be worn out, renewed, or replaced.

Permanent works which might last for centuries, the construction of which might be the truest economy, should in my opinion be the occasion of debenture issues at very long dates.

I am of opinion, that, there should be no restriction as to date of payment of debentures issued for permanent works, provided that it be within the probable life of the work. There is a vast difference between the most indestructible and the most perishable of public works; and almost all shades of difference between the two extremes. Many improvements may very properly be the occasion of debenture debt, with great financial

advantage, and yet not warrant deferring redemption, even for twenty years.

On no account should permanent debentures be issued by any municipality, unless and until, permanent or everlasting works have been acquired to an equivalent value. Debentures issued for payment of land purchased for a public park, may be made permanent, not only with prudence and propriety, but with the greatest possible attending benefit to the community. I assume, that, as a matter of common sense, legal restrictions will be enacted governing the issue of permanent debentures. This being done, of course property so purchased, will be required to be permanently and untransferably vested in the municipality; unless and until power of sale given to the holders of the debentures is exercised, owing to non-payment of interest. Thus the painful and shameful calamity can never happen to the inhabitants of seeing their city oases encroached upon until they grow into nothingness. The amount expended in transforming the natural land into a beautiful park, may justly and quite properly be added to the amount of debentures made permanent, to the extent of the value of the improvements that are permanent. More latitude can be allowed in the case of land, than in any other investment, because, in cities, the old saying, "*res crescunt*," is usually applicable to the value of land. The purchase of land of any kind by a municipality may and should be the occasion of the issue of permanent debentures. Justice to the rate-payers demands it. Nothing but land, unless there could be a municipal monopoly of air or water, should be purchased with the proceeds of permanent debentures. Buildings constructed of blocks of granitoid stone, adhered to each other by thin layers of cement instead of mortar, on an indubitably solid foundation, which might last for many centuries, might at first sight seem to warrant the issue of permanent debentures for their construction. It is far better, however, to make the debentures payable at some very long date, as nothing can be absolutely everlasting but the land. The date of payment may, however, be so far remote as to reduce the annual sinking fund to a comparative trifle. To produce \$700,000 at the end of 100 years, only requires a Sinking Fund of \$565.60 per annum invested at 4 per cent., payable yearly; or \$268.20 per annum invested, at 5 per cent., payable yearly.

The principle governing the date of payment, in justice to the ratepayers, both of the future and the present, should be, as far as is possible, to make the period during which interest and sinking fund are being paid, agree with the period during which the inhabitants or owners for the time being are enjoying the results of the application of the funds borrowed. A careful consideration of what I have said will convince the hearer or reader that, if the principles I have enunciated be strictly adhered to, this result will be accomplished as nearly as the mists which veil the future will admit of.

EXERCISE OF POWERS.—Should any municipality have become involved to an extent rendering it inconvenient to the ratepayers to meet the obligations, it would be right and extremely convenient to adjust the payments by reorganizing the debt on the principles I have laid down. That is, to issue permanent debentures for land acquired, and other debentures at various dates corresponding with the expectant life of each work respectively, the proceeds to be applied in purchasing and redeeming existing debentures.

In considering the expediency of incurring any debenture debt, of course it is unnecessary to say, that, the first question to be looked to, is, the ability of the ratepayers to meet the interest and sinking fund, without having to pay an excessive rate of taxation. In this connection, however, the result of the work forms a very important element. The work to be undertaken may replace that which is a source of great expense. Then again the construction of the new work may be calculated to increase the ratepaying power of the municipality.

Before any work is undertaken, or estimates therefor adopted or any by-law drafted for authorizing an issue of debentures, a careful comparison should be made of the relative annual cost to the ratepayers, of all the various modes of construction that are worthy of consideration. The sinking fund necessary to be set aside annually, is so very much less in proportion to the debt, on long date debentures, than on those of comparatively short date, that this question is of vital importance, assuming, as I do, that power will be given (if indeed it does not already exist) to issue debentures at any date warranted by the durability of the works. The effect of compound interest on the annual amount invested as

sinking fund, is such, that by deferring the time for the redemption of the debt, a work of much greater durability, utility, or other advantage, may be secured at the same annual cost to the ratepayers.

I give an example here, which it must be remembered is not adjusted from actual estimates of any work, but is only for the purpose of illustrating the principle.

A certain work is proposed. The engineer reports that it can be constructed for \$500,000, but that if another \$200,000 be expended, it can be made almost indestructible. An estimate is made of the relative cost to the ratepayers as follows:

Amount.	Time.	Sinking Fund.	Interest.	Total Annual Amount.
\$500,000	20 years,	\$15,121.30	\$25,000	\$40,121.30
700,000	50 years,	3,343.72	35,000	38,343.72

The interest, as you will see, is assumed to be 5 per cent. The valuation of the yearly sinking fund is made at the same rate, capitalized yearly.

Assuming interest to be 4 per cent. the figures will be :

Amount.	Time.	Sinking Fund.	Interest.	Total.
\$500,000	20 years	\$16,790.87	\$20,000	\$36,790.87
700,000	50 years	4,585.14	28,000	32,585.14

I have computed the annual amount of sinking fund according to the law of the Province of Ontario—compounding the interest *yearly*.

It should always be the aim of municipal boards to secure works that will outlive the redemption of the debts incurred for their construction. This result is more likely to be attained by acquiring works of the greatest durability, notwithstanding deferment of redemption. The nearer the approach is to the everlasting, the least costly is the work in the end.

RECITAL OF DEBTS.

The recital of debts of a municipality, in its by-laws, should include debts incurred on the security of local assessments. It is well to state how much of the debt is thus secured, but full

particulars are justly due to purchasers of debentures, and when given tend to increase the standing of the municipality at home and abroad.

REGISTRATION.

Debentures issued for local improvements should be registered by the municipality. Not only should reference to the registry office reveal the general debt, but every debt of the municipality. Indeed debts for local improvements call for registration more than general debts, because a special and preferential lien on certain properties is thereby created, and such lien should be exhibited by the records of the registry office for reference concerning the properties affected. There is no valid reason why the registry office should not exhibit every lien upon the municipality as a whole or locally, just as fully as in the case of separate properties held by individual owners. It is needless to add that every cancellation of a by-law should also be registered.

SINKING FUND.

COMPUTATION.—As almost all debentures bear interest payable half yearly, the interest should, technically speaking, be capitalized half-yearly on a yearly estimate. The amount provided as sinking fund, may be assumed to be raised annually, but so soon as the annual amount is actually invested, it bears in most, if not in all, cases, half-yearly interest, and such interest is, or should be re-invested immediately it is received. Practically, however, there is frequently some delay and often slight expense occasioned in profitably re-investing the interest. To be on the safe side, it is wise to compute the interest as though it were received *yearly*.

In order that municipal officers may see at a glance, what the relative difference is between yearly and half-yearly interest, I give the following comparison of the annual amount of Sinking Fund necessary in each case to provide for the redemption of an issue of \$1,000,000 :

		3 per cent.	6 per cent.
10 years.	{ Yearly Interest.....	\$87,230 51	\$75,867 96
	{ Half Yearly Interest...	87,140 15	75,547 89
50 years.	{ Yearly Interest.....	\$8,865 49	\$3,444 29
	{ Half Yearly Interest...	8,806 70	3,342 74

It will be seen that the differences on ten years debentures, between the rates 3 and 6 per cent, range from \$90.36 to \$320.07 annually to produce \$1,000,000. On fifty year debentures these differences range from \$58.79 to \$101.55. At all intermediate rates, in each case, the difference graduates between the two extremes. For periods between ten and fifty years, at 3 per cent. the difference graduates between \$90.36 and \$58.79, and at 6 per cent. between \$320.07 and \$101.55. To further illustrate, I give the yearly Sinking Fund for \$1,000,000 in ten and twenty years respectively at $4\frac{1}{2}$ per cent. :

	10 Years.	20 Years.
Yearly Interest.....	\$81,378 83	\$31,876 15
Half Yearly Interest.....	81,187 33	31,707 49

It will thus be seen that the difference will never be larger than is desirable to cover contingencies.

ADJUSTMENT.—Each year, before placing in the estimates the amount required to be raised for sinking fund, under the various by-laws, a valuation should be made to ascertain whether the existing investments have amounted to the sum originally computed as that which would be on hand at that date. If the fund be deficient it must be augmented by adding the necessary amount to the ordinary yearly appropriation.

If it be found that the rate of interest being realized is less than that assumed in making the original computation, the annual amount to be set aside as sinking fund must be re-estimated on the basis of the decreased rate of interest.

Should it be the case that any municipality has neglected these necessary precautions for some years, it would be well in such instances to cover present deficiency in the computation of the necessary annual amount in the future.

If these precautions are taken, fractional adjustments are effected from year to year, which prevent the possibility of such an awkward predicament as that of finding the fund short when the debentures mature.

Should any work become useless or require renewal before the debentures issued for its construction are redeemed, if it is practicable, provision should be made for setting aside the present value of the interest and sinking fund to mature in respect of

such debentures before other debentures are issued for re-construction.

INVESTMENT.—I am very decidedly of opinion that the investment of the sinking fund should, as far as is possible, be the purchasing of the debentures of the same municipality. This system has all the advantages of paying debentures by instalments, while at the same time it does not interfere with the profitable sale in the first instance. There is no risk of loss, and there are no collections to make in realizing on investments.

A municipality quietly buying in its own debentures creates a demand for them in the market. The result is, that, investors finding at all times a ready sale for them at good prices, the demand increases and is always brisk. The tendency is, to enable such a municipality to decrease the rate of interest on subsequent issues.

It must, of course, be borne in mind that, if the sinking fund is so invested, the amount of the coupons must be paid to sinking fund and invested in that behalf, the same as though the debentures bought were those of another corporation.

EXPENDITURE.

The period between the elections and the time for striking the rate, should be largely occupied by the council in discussing the entire needs of the municipality. In dealing with the question of repairs, it should, in each instance, be deliberately considered whether a new work would be less expensive in the end, than patching and mending for temporary necessities. Comparative statements should be submitted, shewing, in each case, what annual amount would be necessary to provide for interest and sinking fund to secure a new work, and what amount would otherwise be necessary for repairs.

The interests of the several wards or parts of a municipality should be duly considered, but not in such a way as to lose sight of the general welfare of the whole. If from any cause there remains a balance unexpended of the previous year, it is right and equitable that such surplus should be credited to the wards or divisions, in proportion to their contributions as per assessment

rolls. If this were done, there would be less jealousy regarding the amount expended in each division in any particular year. Expenditure in this connection, not provided for by local taxation, would, of course, be charged respectively. It is not necessary that, in each and every year, a proper proportion of the taxes raised and available, should be actually expended in that year, in each locality. One ward may be allowed certain improvements in one year, and another in another year. The necessities in each case should be considered for the time being, while the permanent standard should be maintained.

If the council is aware, that, from any cause, the ratepaying power of the municipality is weak during the year current, and there is a balance unexpended of the taxes of the previous year, it is right to appropriate such balance towards the reduction of the taxes for the current year.

STRIKING THE RATE.

In striking a general rate, the various local assessments should always be taken into consideration, because the owners or inhabitants in each locality, cannot be supposed to be able to bear an excessive rate of taxation, even though they have improvements peculiar to themselves. School or other general rates, to be levied separately, must also be taken into consideration for very similar reasons.

The estimates should be considered in order ;

1. Demands for government, county, law, school, or other estimates of amounts to be raised separately or otherwise.

Interest and sinking fund for the year, including amount, if any, necessary to adjust the sinking fund.

Unpaid claims of all kinds, matured and not satisfied or provided for.

Local assessments of all kinds.

2. Expenses.

3. Contingent expenses.

4. Repairs.

5. Improvements.

The first group of items *must* be provided for.

If current expenses added, requires a heavy rate, each item of expense should be carefully considered, with a view to possible retrenchment.

If the question of repairs has been duly considered, in relation to new works, this item can be intelligently dealt with at the meeting.

The securing of improvements out of current revenue, can only be entertained when provision for the other items would require but a low rate of taxation.

If it be clearly seen, that, improvements of a temporary nature not warranting debenture debt, can be accomplished out of rates to be levied, it is well to arrange that the cost of the improvements decided upon, be charged to the ward or division benefited; and that at the end of the year, each ward or division be credited with its proper proportion of the surplus of taxes after providing for the unavoidable expenditure. By this system, it will be seen from year to year, what the relative claims of the various wards or divisions are, upon the general funds. At the same time it will prevent wasting the funds, by dividing them for expenditure in each year.

Should it be found that the rate necessary to provide for the entire estimates is extremely low, it is well to consider whether any circumstances will probably necessitate a much higher rate in the following year. Also to anticipate improvements not warranting debenture debt, but yet too costly for the amount to be levied in any one year.

Provision may very properly be made to meet such future demands, without inconvenience to the ratepayers, by adding a suitable portion of the prospective expenditure to the amount of the estimates, to be covered by current assessment.

It may often occur that, by husbanding the resources of two or more years, preparation may be made for more satisfactory repairs or improvements than could possibly be effected by spending each year the total amount collected.

In computing the amount of taxes resulting from a given rate due allowance must, of course, be made for unrealized taxes under such rate.

Local Assessments.

The following example will illustrate the striking of a local rate on frontage unequally benefited:

A local improvement is undertaken. The total frontage to be taxed is 2,000 feet. The engineer reports that the benefit to be derived by the owners of the property respectively, varies very considerably. In this connection he divides the frontage into five sections—A, 100 feet; B, 500 feet; C, 300 feet; D, 100 feet, and E, 1,000 feet. B is to pay twice as much per foot as A, C three times, D four times, and E five times as much as A.

It will be seen that we must take into account the number of feet along with the proportionate rate in each instance, to ascertain the proportion of cost to be borne by each section. If we divide each by the number of feet embraced, we get the cost per foot. If we assume the cost at \$1, the fraction to be paid on each foot, multiplied by the total annual amount to be raised for interest and sinking fund, will give the annual tax per foot, as follows:

No. of feet.	Fraction per foot of \$1, total cost.
A.. $100 \times 1 = 100 = 1/74 \div 100 = 1/7400 = .000135135''$	
B.. $500 \times 2 = 1000 = 10/74 \div 500 = 2/7400 = .000270270''$	
C.. $300 \times 3 = 900 = 9/74 \div 300 = 3/7400 = .000405405''$	
D.. $100 \times 4 = 400 = 4/74 \div 100 = 4/7400 = .000540540''$	
E.. $1000 \times 5 = 5000 = 50/74 \div 1000 = 5/7400 = .000675675''$	
<hr/>	
7400	

The cost of the work is \$50,000. The debentures are payable in 20 years, and bear 5 per cent. interest. It is presumed that interest will not remain as high as this, and that such a rate cannot be depended upon as that which will be realized on the sinking fund. If the debentures are bought in as investments of sinking fund, they are expected to become worth a premium. It is therefore considered that $4\frac{1}{2}$ per cent. is all that can be relied upon, and the sinking fund is to be estimated at that rate.

The amount to be raised annually is therefore as follows :

Interest on \$50,000 at 5 per cent.	\$2,500 00
Sinking Fund, 20 years at 4½ per cent. (see table, p. 34)	1,593 81
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Annual cost\$4,093 81

It has been decided, however, that the municipality at large will bear 30 per cent. of the cost by general rate. The fractions per foot will therefore be only 70 per cent. of the full fractions given above, viz :

				Rate per foot per annum.
A. ....	.0000945945'''	×	4093.81	= .387252
B. ....	.000189189'''	×	4093.81	= .774505
C. ....	.0002837837'''	×	4093.81	= 1.161757
D. ....	.000378378'''	×	4093.81	= 1.549009
E. ....	.0004729729'''	×	4093.81	= 1.936261

The assessment is made up as follows :

Amount included in General Estimates	\$1,228 14
Section A.... 100 feet @ .387252 per foot	38 73
" B.... 500 " @ .774505 "	387 25
" C.... 300 " @ 1.161757 "	348 53
" D.... 100 " @ 1.549009 "	154 90
" E....1000 " @ 1.936261 "	1,936 26
<hr/>	
	\$4,093 81

ASSESSING.

It is of the utmost importance, both as regards the municipal treasury and the individual ratepayers, that the valuation of the property assessed, should be as exact as possible ; and that nothing assessable be omitted from the rolls. If this be not effected, the candid and conscientious ratepayers are those who suffer.

Under-valuation tends to injure the credit of the municipality, because not only does the property appear less valuable than it really is ; but the rate levied is necessarily higher to produce the required amount of taxes. The municipality thus appears to be not only less wealthy, but also more extravagant, than is really the case.

It is, however, equally important that there should be no over valuation ; for, not only is this dishonest to the creditors of the municipality, but dangerous to the ratepayers as encouraging heavy taxation.

Assessors are too apt to err in under-valuing. It is to be feared that this is done to a very great extent, in most cases of personal property, especially where the amounts are large. Why should not the amount in every instance be an exact valuation ? If it were the practice, and known to be so, ratepayers would be more candid with assessors and more likely to reveal correct values.

In assessing personal property, it would appear that, a guess is ventured, and if there be no appeal, it stands at that amount.

In valuing real property, it is simply a matter of appraisement ; but how is it possible to appraise the capital of a manufacturer, or a merchant, or the income of a professional man ?

How is it possible for an assessor to value the amount of liabilities in excess of outstanding assets, to know what may be deducted from the visible machinery, tools, merchandise, &c., which are tangible, unless he examines the books in which the transactions of each business respectively are recorded ? How is it possible for him to value the income of a professional man, commission merchant, broker, and such like, unless he is shown all the transactions ?

A statement should, in every case without exception, be made by each ratepayer in writing and under oath. Why should not each ratepayer be required to make returns of the actual value of his personal property, and be held responsible for his statements, with the same exactitude as would be required of him in respect of imposts or excise duties ?

ACCOUNTS.

Before proceeding to enunciate my views regarding the keeping of municipal accounts, it is necessary to deal with questions which affect the preparation of the books to be used.

ARREARS.—There should be, in my opinion, a more simple and concise method of dealing with arrears of taxes.

I fail to perceive that any advantage is to be gained by anyone from the reporting of arrears by the minor municipality to the

county, unless and until the arrears have reached that point when the land is liable to be *sold* for taxes.

After the time has passed during which taxes ought to be paid in each year, a return should be made by the minor municipality to the county, shewing what properties are then liable to be sold for taxes. Only between such date and the day of sale, and only concerning such properties as are liable to be sold, should it be necessary to apply to the county officer at all. A sale should be held by the county officer once only in each year, when there is any property liable to be sold. Such sale should be held before the time for striking the rate by the minor municipality. Immediately after such sale the county officer should make a return to the minor municipality, showing the result of each sale, and remitting the money collected, after deducting his charges, if he be entitled by law to make any charge. The transactions of each year should thus be closed and balanced. The only record necessary on the part of the county officer is a full account of the circumstances connected with each sale and its result. It is not necessary that the county officer should keep any further account concerning arrears of taxes. This system and process should go on from year to year, the county officer acting each time solely on the new report handed him from the minor municipality.

It is quite immaterial, to my mind, which county officer is responsible for the holding and carrying out of these sales. If I had the framing of the statutes, I should be inclined to enact that the sale should be held by the sheriff.

The full record of arrears should remain permanently and continuously with the minor municipality, in the rolls brought forward from year to year. Thus the arrears are kept alive against each property not sold, for the continual use of collectors, treasurers, clerks, and ratepayers in the several municipalities where the assessments were originally made. Each sale should also be recorded in the several rolls respectively.

In the case of cities, the treasurer is, or should be, in possession of the necessary information, and has simply to record the sales he effects.

TIME OF BALANCING.—It is extremely desirable, in organizing the simplest method of keeping accounts, to arrange for the balancing and annual statements to be rendered at the proper time.

The present system of balancing at 31st December, is extremely awkward. A considerable amount of taxes assumed to be collected by that date, are, as a matter of fact, collected afterwards. The date of the balancing of the books, need not, and does not, influence results in this respect. Punctual payment has to be encouraged either by discount allowed, fine for omission, or summary measures.

The proper time for balancing the books of a municipality is when? Do you not all grasp the idea before it is expressed? When should it be, but after the assessment is completed, the revision is ended, the rate is struck, the clerk has had the taxes extended and is ready to insert in the new rolls the arrears of taxes from the rolls in use, and all is otherwise ready for the collector to commence his work in connection with the new roll? Then it is that the treasurer should close his books and hand over to the clerk the old rolls. While the clerk is entering the arrears in the new rolls, the treasurer should be balancing his books.

The clerk, while entering the arrears in the new roll, having thus both before him, can detect any omission or inconsistency in the new rolls.

When the clerk has completed his entries of arrears in the new rolls, the treasurer should check these entries as agreeing with the old rolls, which may then be filed away as a record of the past.

The clerk should be the party to notify all ratepayers in arrears. The wisdom of this arrangement is so apparent that comment is needless.

Assuming that amendments, such as I have recommended, are effected as regards arrears and date of balancing, I now proceed to describe the system of accounts which I have to suggest, beginning with the assessment roll.

It should be a fundamental principle, in devising any system of accounts, to avoid all unnecessary repetition of labour. Where this is accomplished, liability to error is necessarily reduced, and time is saved whenever it becomes necessary to refer to original records.

ASSESSMENT ROLLS.

The assessment rolls, being the source from whence the taxes due by each ratepayer are computed, should unquestionably, if practicable, without sacrificing other necessary considerations, be the same books in which the payments under the assessment are recorded.

In the case of a township or village this cannot be done without very serious objections, more than sufficient to counterbalance the advantages to be gained. The collectors, as a rule, have their offices at their own dwellings, and the collectors' rolls are in private hands, at private residences or carried about. They might be lost or destroyed by fire. If no other record of the assessment existed, should the necessity arise for the reproduction of collectors' rolls, a new assessment would also be required. The remotest possibility of such chaotic results is sufficient to banish all idea of using the assessment rolls as collectors' rolls in the minor municipalities. The labour, however, of re-writing the names, addresses, amounts, &c., in the case of a township, is comparatively light.

With regard to cities it is very different. The collector's office is, or should be, in the municipal buildings. Indeed, it ought to be adjoining the treasurer's office. The rolls should never be removed from the municipal offices. After all the ratepayers have been duly served with notices of taxes payable, the rolls can be kept in the treasurer's office. They would, however, be perfectly safe in the collector's office, should they be required for use there. They could, in that case, be obtained from the treasurer every morning and returned to him every night, if such a precaution were deemed necessary.

If the statements rendered to the ratepayers, show all the component parts of the taxes payable, precisely as they are extended in the rolls, as should always be the case; and if these statements be required to be brought to the collector's office, when payments are made; and if the collector's cash book has the necessary columns identical with those in the rolls, the posting should be done in the treasurer's office.

After very careful consideration, I fail to discover any objection to an assessment roll for a city being used as collector's roll,

beyond such as, if valid, would necessitate every record of the municipality being kept in duplicate.

The size of the book necessary might frighten one at first thought. I find, however, that many columns of the assessment roll are applicable only to farm lands and to those engaged in agricultural pursuits. By omitting these the horizontal space occupied by the necessary columns is reduced nearly one half; so that no insurmountable difficulty exists as to the size of the book required to serve for both purposes.

COLLECTOR'S ROLLS.

As I have endeavoured to show, the collector's rolls in cities should be, the extension of the assessment rolls. It remains to exhibit what columns should be added to provide for collecting. When this is done, the same form is available for separate collector's rolls, in addition to those columns of the assessment roll which have to be copied. In either case, the last column to the right preceding those I shall name, should show the value of the property assessed. The two columns immediately preceding the assessed value, should contain the name and address of the ratepayer.

I will proceed to the right hand, numbering the columns for brevity and convenience.

1. Two money columns; one for additions to, and the other for subtractions from, the assessed value.

2. Two columns; one broad and the other for money; to record revised assessments, and the authority therefor.

3. Current rates in detail; as many money columns, as there are various rates to be kept separate in the ledger.

4. Total current taxes payable in each case.

5. Date of demand by the collector, or the serving of the notice, as may be required by law.

6. Repetition of the number on the roll. The clerk should fill in the number in this column, when the rates are extended. This is a check upon the extending of the taxes on the right line. The collector is reminded by this, to mark the number on the bill of taxes. It also facilitates the posting of payments in the rolls.

7. Current taxes paid; columns for date of payment, number and folio of collector's cash book, and amount.

8. Arrears of taxes ; as many sets of columns as there are years of arrears necessary to be kept separate. Each set of columns should have one for each rate kept separate in the ledger.

9. Arrears of taxes paid ; columns for date of payment, number and folio of collector's cash book, and amount.

10. Date of report to county treasurer of lands liable to be sold for taxes. This column can be utilized by the treasurer of a city, for remarks pertinent to the same subject, such as date of advertising sale, &c., &c.

11. Date of sale for taxes, with room for further particulars and remarks.

12. Taxes written off by the authority of the council, columns for money and reference to minutes.

In cases where taxes are payable by instalments, there should be, between the lines showing the amount due by each ratepayer, as many faint blue horizontal lines as there are instalments which may be paid separately.

To use a hackneyed phrase, "imagine the thing done, and see what it looks like."

For cities, the routine would then be as follows : The assessors take the blank rolls, and fill in the particulars and valuations required by law ; adding up the columns requiring addition and initialing the totals, they sign their reports, making the necessary affidavits, and hand the rolls to the clerk, completed as far as their work is concerned. Thenceforth the rolls are lodged in the public offices of the municipality, never to be removed, unless and until, from lapse of time, they become utterly useless, and are destroyed as rubbish by authority of the council. After the Court of Revision has completed its work, and every revised assessment has been recorded on the rolls in the presence of the Court, the clerk extends the various rates and the total payable by each party assessed ; adding up all the columns and certifying to the correctness of the work, he awaits the arrival of the day fixed for closing the books. When that day arrives, the treasurer hands the old rolls to the clerk, posted to date. As I said before, while the clerk is entering the arrears, the treasurer is balancing his books, which of course have been kept balanced every month. When the clerk announces that the arrears are brought forward

in the new roll, and added up respectively, the treasurer checks the totals, by seeing that taxes paid and written off, if any, added to arrears, balance exactly with taxes levied in every division of each year's taxes. The treasurer then certifies to the correctness of the clerk's certificate as regards arrears. The clerk then notifies all parties in arrear, and hands the rolls to the collector. The collector makes out the accounts, numbering each one, as numbered on the rolls. The printed form used for this purpose should specify each separate rate, and in the same order in which they appear on the rolls. There should be a notice thereon, requiring each ratepayer to present it when tendering payment, and stating that if lost or mislaid, a duplicate must be applied for of, and will be supplied by, the *treasurer*. This will effectually prevent the collector being worried, by having to give information, while his hands are full receiving money ; while at the same time it will remove all difficulty in the way of keeping the rolls in the treasurer's office. This notice should be printed in ink of a different colour from that used in printing the body of the tax account, and should be made conspicuous. There should also be a notice, printed in heavy type, demanding payment on or before a certain day, and reciting the loss or penalty incurred by non-payment then or previously. This notice should specify exactly where such payment is to be made, giving the number or other full description of the collector's office, in the municipal buildings. The collector serves these notices, recording the date of service in each case ; and so soon as all notices are served, he certifies to the fact on the rolls and hands them to the *treasurer*.

Just here, a thought occurs to me. Would it not be a mercy to the employees in the collector's office, as well as a great convenience to the ratepayers, if the by-law of a city fixing the date, on or before which taxes must be paid, were to name a separate day for each ward ?

COLLECTOR'S CASH BOOK.

The collector's cash books must next be considered. For a township, village, or small town, where the payments are not too numerous to admit of one person at a time receiving cash, of course one cash book is all that is necessary each day. This, how-

ever, should be in two volumes ; each used alternately during the day, week, or month, respectively, intervening between the periodical deposits with the treasurer.

In the case of cities, however, at certain periods of the year, it requires several persons to wait on the ratepayers simultaneously. For want of a proper system, I have known loose sheets of paper to be used by the collector's assistants. Yet, it almost seems insulting to the good sense of the public, to say nothing of the judgment of an expert, to utter anything so self-evident as to say, that, this should never be done under any circumstances. There should be a sufficient number of subsidiary cash books to serve the purpose. These should be in two sets ; each set in consecutive alternate numbers ; one odd and the other even. The odd-numbered set should be used one day, and that with even numbers the next ; and so on continuously. These books should be ruled precisely the same as the collector's general cash book.

For the guidance of inexperienced young men, who may be entrusted with the receiving of money, I would note, that, the amount received, should, in every instance, be entered in the cash book, before the receipt is signed, or the money placed in the till. Only one assistant should use the same cash book on the same day ; and he should keep the cash received by him separate from all other cash received. At the close of the day, each assistant should balance his cash, and sign his name opposite the amount in the book which he has used. The collector should also sign his name in the same book, acknowledging receipt of the amount from his assistant. The collector should enter in his general cash book, the totals of each subsidiary book, and balance his cash, then and there, and hand over to the treasurer the amount along with all the subsidiary cash books containing the details. When such a collector personally receives payments of taxes, he must also use one of the subsidiary books for recording the details. If from any cause, such as extreme press of business or deficiency in his staff, the collector has not secured the proper filling in of the component parts of the taxes in all the subsidiary books, the details neglected can be filled up in these books, on the following day, in the treasurer's office.

With regard to the cash received from the ratepayers, by the collectors, it seems needless to state, as I have done, that in cities it should be paid over daily to the treasurer; the propriety, utility and convenience being so apparent. Yet I have known a collector to bank the money himself, and hand cheques to the treasurer from time to time for round sums. In minor municipalities, where the officers often live miles apart from one another, and where there are no municipal offices, properly so called, the collector cannot report and account to the treasurer daily. He can, however, monthly, or even weekly, and every time it should be the handing over of the exact amount collected to that date, with the full particulars. In fact, as explained, the handing over of the cash book last used, along with the cash collected.

The collector's cash books and the subsidiary cash books should all be ruled as follows, commencing at the left hand and proceeding to the right :

1. Date of receipt.
2. Name of ratepayer.
3. Address of ratepayer.
4. Number on the roll.
5. Amount of taxes received (total).
6. A set of columns corresponding with the roll, shewing component parts of current taxes, the totals of which have to be posted separately in the ledger.
7. The same set of columns, for as many years of arrears as are necessary to be kept separate. The last of these to contain the oldest arrears, including all not separately provided for.
8. Date and amount of money paid over by assistant to collector, or collector to treasurer, as the case may be.
9. Two spaces for signatures ; one certifying to correctness, the other acknowledging receipt of amount.

Columns 2, 3, and 4, in the general cash book, can be utilized for inserting the name of the assistant, and the designation of the subsidiary book used by him. Thus one printed form will answer for both purposes.

TREASURER'S CASH BOOK.

The Treasurer should have a column cash book in two volumes—one for receipts and bank deposits the other for bank cheques and payments. In every instance where deposits are made in more than one bank, or special deposits in the same bank, a separate column with suitable headings must be used in each volume. The advantages of this system are so obvious that to suggest it is all that is necessary. The volume for receipts shows the entire revenue and where it has been banked. The volume for payments shows the entire expenditure, and from what bank account the money has been withdrawn. The room for columns in the same sized book is doubled as compared with attempting to show both receipts and payments in the same volume. The convenience in use and during audit is strikingly apparent.

The volume for receipts should, in addition to the date column and that for describing the entry, which for convenience we will call 1 and 2, be provided with the following: proceeding to the right.

3. Ledger folio for items posted separately.

4. Such items.

5. A few blank columns for new sources of revenue arising with frequent transactions, or for unexpected increase of transactions, in accounts not pre-supposed to require separate columns.

6. A separate column for each source of revenue kept separate in the ledger, the transactions concerning which are frequent during the month. These columns must embrace, as the last to the right hand, an exact repetition of the tax columns in the collector's cash books.

7. Total amounts received daily from collector. This column shews simply the addition of the tax columns, but is necessary in case that, from press of business, the collector cannot at the moment of payment, exhibit the component parts of his receipts. It serves as an exhibit of collector's account. It should be distinguished from all other columns, say by perpendicular lines of ink of a different colour from the rest. There should be in this column a sub-column, for the number and folio of collector's cash book.

8. As many columns as are necessary for bank deposits, with a date column to each; or, if necessary, to economise space, one date column for the whole. These should be to the extreme right, except a margin if the paper will admit of it.

The volume for payments should have columns arranged in the following order; proceeding from left to right:

1. Number of voucher.
2. Cheque numbers.
3. Cash columns for the cheques on each bank account separately.
4. Cheques cashed by the treasurer for petty or other payments.
5. Such payments made by treasurer from proceeds of such cheques. These two columns should be enclosed by perpendicular lines of a different colour from the rest. All the payments, of course, should be extended in the proper columns for posting, and all the cheques in the proper bank columns. The total expenditure deducted from the bank cheques, exhibits the cash which the treasurer should have on hand, while the repeated items in the treasurer's column deducted from the repeated cheques, shows the same balance.
6. Date.
7. Description of the entry.
8. Ledger folio for items posted separately.
9. Such items.
10. As many columns as there are ledger accounts, the items of which occur constantly during the month.
11. A few blank money columns for new accounts not foreseen, concerning which transactions may be frequent.

VOUCHERS.

The most convenient way of numbering vouchers, is, to adopt, in every instance, the number of the cheque. If there be a number of payments made from the proceeds of one cheque, such as disbursements by the treasurer in money out of the proceeds of a cheque in his favour, the vouchers should be sub-numbered, with the prefix of the number of the cheque. Should a number of cheques be issued, the receipts for which are covered by one voucher, such as that of the officers' pay roll or otherwise, the voucher should carry the several cheque numbers. If there be

more than one bank account, there is nothing to prevent as many series of voucher numbers as there are bank accounts.

There should be an index to vouchers—a complex index for ready reference. A large number of vouchers can be indexed under classified groupings. Many will be for regular periodical payments, against the classification of which in the index, it will be sufficient to record, “monthly,” “weekly,” &c., without further posting. All vouchers for payments on account of contracts, or for goods purchased, and the like, should be indexed under the name of the individual, firm, or company to whom the payment is due.

The treasurer should not pay any money, or deliver any cheque, without receiving a voucher reciting full particulars concerning the payment, even though there be only one item, or that the cheque be made payable to order.

On making any payment, the last voucher from the same party or parties should always be referred to, to make sure that the same item is not charged more than once.

Every voucher should have recorded on it the number of the last one received from the same party.

PAY-ROLLS.

There should be as many pay-rolls (or more properly speaking pay-registers) as there are pay-masters. If, for instance, the wages certified to by the city engineer, or any other head of a department, are paid out by several clerks, each party paying the wages and taking the receipts, should be supplied with a separate pay-roll and the proceeds of a separate cheque. The separate pay-rolls must, of course, be made out in such a way as to enable each workman to know who to apply to for his wages.

The pay-rolls should, in every instance, be books ; never on any account should loose or unbound sheets be used.

There should be, to the extreme left hand, a column for the folio of the time book or other record from which the wages are made up. If there be no time register, other than the time books of the foremen, column

1, should be wide, and the name of each foreman respectively should be recorded.

2. Designation of the work on which the labour has been bestowed.

3. Designation of the accounts to which it is to be charged.

4. Name of labourer.

5. A column for each day intervening between pay days for recording daily time—that is, if there be no separate general time register, also a column for the total number of days' work, or this latter column only if there be a time register.

6. Rate of wages per day.

7. Amount of wages due ; 8. Totals, per ledger accounts.

9. Signatures acknowledging receipt

10. Remarks. Note here that remarks should never be written in the column for signatures. There should remain a blank against every amount, the receipt of which is not acknowledged. If paid and not acknowledged, the fact can be recorded in the column for remarks, and the signature obtained at first opportunity.

11. As many money columns as there are ledger accounts affected by the payments.

The wages, after being made up and duly checked and certified to by the engineer and other heads of departments, respectively, should be extended in the classified money columns and added up. As I said, a separate cheque should be made out for each roll. This should be made payable to the order of the officer responsible, no matter who he may justly and properly entrust with the paying of the wages. Such responsible officer should sign a receipt for each cheque to his order, reciting therein :

For week ending pay-roll folio

This cheque should be entered in the cash book, and also the totals of the classified columns of the pay-roll, as the details of the expenditure covered by such cheque, before the cheque passes out of the hands of the treasurer.

Should it happen that any wages are unclaimed by the time that the next cheque is issued under the same pay-roll, the unclaimed amounts should be deducted from the new totals of all the columns affected, and the cheque issued for the balance of cash required, and so on continuously.

If it be thought preferable, or more strictly correct, to record unclaimed wages as a liability, the amount not applied for may

be returned to the treasurer in cash and credited to "unclaimed wages."

DEBENTURE REGISTER.

A properly prepared and carefully kept debenture register is of great importance. Not only does it serve purposes of ready reference as to debenture debt, but also as regards maturity. Nor is this all. It should exhibit such information as will effectually prevent the necessity for keeping separate ledger accounts for each issue of debentures and each relative sinking fund.

The debenture register should have the following columns, commencing from the left hand :

1. Number of by-law.
2. Date.
3. Number of years to run.
4. The work for which they are issued.
5. Debenture numbers, singly, one on each line, no matter how small each debenture or how numerous the whole issue.
6. The sterling amount of each debenture payable in sterling, ruled for pounds, shillings, and pence.
7. The currency amount of each debenture payable in currency, ruled for dollars and cents.
8. Total in sterling of sterling debentures.
9. Total in currency of currency debentures.
10. Rate of interest payable.
11. Yearly sinking fund to be provided. This should be ruled for rate of interest at which the sum is computed, and for the annual amount.
12. Where payable.
13. When due—day, month, and year.
14. When interest is payable—day and two months.
15. Twelve columns, one for each month in the year; each divided into three : 1. Year of maturity. 2. Sterling amount of interest payable in sterling. 3. Currency amount of interest payable in currency.
16. When paid and cash book folio.

If the number of debenture issues of a municipality are small and not likely to increase much, the space can be curtailed and a

smaller book used, by substituting for columns numbered 15, twelve narrow single columns, one for each month of the year, in which to insert the years of maturity, and say "Int." in the months in which the principal and interest mature respectively.

If all interest be made payable on the same two days in each year, and all principal on the same day in the respective years, columns numbered 15 will not be required at all; 13 will only require one column for year of maturity, and for 14, two columns substituted for amount of sterling and currency interest respectively.

Whenever any debentures are paid, other than as investment of sinking fund, the total amount paid should be deducted from the running grand total of debentures issued. The amount of yearly sinking fund in respect of such debentures paid, must also be deducted from the grand total of yearly sinking fund. The interest thus ceasing must also be deducted from the grand totals of interest payable. The totals of the debenture register will, thus, always shew the debenture debt and the annual sinking fund required.

It must always be remembered that debentures redeemed before maturity by investment of sinking funds, must never be thus written off until they mature, as pointed out under the heading of sinking fund.

Local debentures may either be recorded in a separate part of the same register, or in a separate volume.

JOURNAL.

With regard to the journal, I can only say what every expert will at once endorse, that the entries should be no more than are unavoidable. As a rule, the introduction of the rates levied into the ledger, the correction of errors, and the closing of the accounts, embrace all the entries that should find a lodgment in this most essential but most abused medium of effecting ledger entries.

LEDGER.

The ledger of a municipality is, of course, no exception to the general rule. There should be no more accounts opened, than are necessary for purposes of management, the exhibiting of results

and convenient adjusting of the various transactions. A balance sheet taken from the ledger, should at all times show, in a concise form, the salient points regarding the working and financial position of the municipality.

As it is necessary that a ledger should show all assets and liabilities, as well as receipts and expenditure ; I have no hesitation in asserting, that, so soon as the collector's rolls are completed by the clerk, and before they are handed over to the collector, the treasurer should make a journal entry, charging the various tax accounts with the rates assessed and crediting, say, "assessment account" with the total.

Whenever a minute is passed by the council authorizing the writing off of taxes known to be irrecoverably lost, the treasurer should make a journal entry charging "assessment account," and crediting the various tax accounts in detail.

Cash receipts should, of course, be credited to the various tax accounts as received. Cash payments to school trustees, county treasurers, and so forth, should be charged direct to them as if personal accounts. In the same way, the expenditure of money received on local assessments, must be charged to the work or expense for which the tax is raised. At the end of the year, school trustees, county treasurer, and local expenses, &c., are all credited with the respective amounts actually realized ; sinking fund is credited with the necessary amount, and revenue with the balance available. The whole is charged to assessment account. The balance remaining at the credit of "assessments," will then exactly balance with the several amounts of uncollected taxes at the debit of the various tax accounts. These will also exactly agree with the arrears brought forward in the new rolls.

With regard to debentures, I am in favour of one account in the ledger for general debentures, and one for local, with two corresponding sinking funds. The register should supply all the details that are necessary.

The amounts credited to sinking fund, and all interest earned thereon, must remain at the credit of the fund ; and no debit whatever be made until debentures fall due and are paid. As each issue of debentures is paid, of course the cash payment of the whole issue, is charged to the debenture account.

Immediately the payment is effected, an entry must be made charging sinking fund and crediting capital account with the portion of the sinking fund which has been accumulated in respect of such debentures, which should be the amount of the debentures.

The investments of the money at credit of sinking fund, must of course, be charged to the debtors under such investments. The interest may, and most properly should, in the first instance as received, be credited to the debtor's accounts to exhibit how they stand; but on closing the books each year be carried to credit of the sinking fund. When the principal of these investments is collected, it will of course be credited to the debtors respectively. When the sinking fund moneys are all invested in redemption of the debentures, the investments will be comprised in one account, say "sinking fund debentures," which will have to be treated precisely the same as though the municipality was the debtor.

There should be a separate ledger account for every permanent work. These should all be in the same part of the ledger. They should appear on the balance sheet, monthly as well as yearly, in the margin; extended in one sum. Assets of any kind, provided for and paid out of the current revenue, should be charged to, and remain at the debit of suitably designated accounts, intelligibly setting forth the nature of such assets. The amounts so paid, must be charged to revenue and credited to capital, at the end of the year. It is well, in the headings of the ledger account for works, to state "under by-law No. — debentures issued for \$—— on such a date." When debentures issued at the same date under the same by-law, cover more than one work; it should be added, "of which \$—— for this work."

Capital account should be charged, and the various works credited, at the close of each year, with the amount of depreciation in value, so as to reduce the amount at the debit of each work to the then actual value.

Repairs should be charged to each work respectively, ad-interim, but written off if the increased value does not warrant the addition, or so much thereof as is necessary to reduce the total amount at debit to the actual value.

Ward accounts should also be together in the same part of the ledger. They may be extended separately or together on the balance sheet. Each ward should be charged with the expenditure specially arranged to be incurred out of the general taxes. At the end of the year, each ward should be credited with its proper proportion of the surplus taxes including such expenditure, closing revenue account ; leaving the actual expenditure so incurred, at the debit of the ward benefited, and its share only of the surplus taxes at its credit.

In closing the books at the end of each year, interest should be charged, and accrued interest credited, with the amount of interest accrued on debentures but not due or not paid to date.

Immediately after the closing of the books, this entry should be reversed.

With regard to expenses : it is worse than useless to have an unlimited number of accounts opened, as is the practice almost universally. The council should carefully and deliberately consider in consultation with the officer who keeps the accounts, what expenses should be recorded separately for economic purposes. A system should be arranged by which the balance sheet will exhibit at a glance the totals sought to be known. A column ledger greatly facilitates the exhibiting of such detailed information as the council or ratepayers may desire. The fewer the accounts the better, and the less sub-division there is, the greater is the attention paid to the items. The ledger accounts should be only such as are absolutely necessary to shew a distinction between the expenses arising from varying circumstances. For instance, salaries, miscellaneous expenses, incidental expenses, donations and relief, all these are governed by a separate set of circumstances respectively, and the totals should be shown on the balance sheet. For convenient analysis, however, salaries may be divided in the marginal columns of the ledger into departments : such as city offices, city engineer's department, assessment and licence commissioners, or any sub-division to suit the fancy. Expenses might be sub-divided into "Rent, fuel, and light," "Printing, advertising, and stationery," and so forth, the fewer the better. So with incidental expenses and donations.

STATEMENTS.

If the ledger be properly kept, the statements will partake of the same systematic character.

In exhibiting receipts and expenditure, the details, as far as are necessary to digest the transactions in a lucid manner, should be noted in the margin, and the totals so extended as to show a brief condensed epitome of the whole. For instance, expenditure should be extended in totals, with a view to exhibiting at a glance the salient points, such as "Annual expenses," "Incidental expenses," "Repairs," "Improvements," "Public works," "Buildings," "Land," "Sinking Fund Investments," and so forth.

Liabilities and assets should be dealt with in a similar way.

MINUTES.

All minutes should be indexed under the designation of headings or references.

The comptroller, or auditor, as the case may be, should have power to alter such headings or references, so as to express more clearly, if necessary, the nature and bearing of every minute, and to see that the corresponding alteration, if any, in each case, is duly made in the index.

TABULAR COMPUTATIONS.

It is of the utmost importance that all those who have to deal with the question of debenture issues, should be in possession of full information, in the most convenient form, as to the equal amounts required to be levied annually, to pay off both Principal and Interest.

SINKING FUND TABLES.—I have already drawn attention to the advantages to be gained by making the Debentures payable at the end of a suitable period of time, and investing the Sinking Fund in the redemption of the Debentures, by buying them up in the market. I have prepared with the greatest care, a table shewing the amount of Sinking Fund necessary to be set aside annually, to provide the required amount, at any rate of interest from 3 to 6 per cent, for any number of years at the end of which Debentures are at all likely to be made payable. This Table shews in a single column, the annual Sinking Fund necessary to

be invested at any of the above rates of Interest during each series of years, and enables the municipal financier, at a glance, to make any comparison of relative annual cost of works varying in value and durability. When it is decided that a specific issue of Debentures shall be submitted to the rate-payers for approval, this Table enables the clerk of the municipality to ascertain readily the amount of annual Sinking Fund to be added to the Interest and recited in the by-law. Public companies and private individuals purchasing Debentures, and their solicitors, can also see by this Table whether proper provision has been made in the by-law for the necessary amount of Sinking Fund.

INSTALMENT TABLES.—Small municipalities frequently find it to be most prudent and convenient to make each issue of Debentures payable in yearly sums. When this is to be done, it is necessary to know what amount must be paid off each year, in order that the Principal so paid, together with the Interest, shall each year amount to the same sum. I have therefore added Tables shewing the exact amount of Interest and Principal respectively, payable each year, in order to reduce to an equal annual sum, the amount to be levied. This will be useful to Financiers and Clerks of municipalities issuing Debentures payable in that manner, and also to purchasers of such Debentures, and their solicitors precisely in the same way as is the Sinking Fund Table in the case of Debentures payable at the end of a certain number of years. It has not been thought necessary to carry these Tables below 4 per cent, nor to provide for smaller fractions than $\frac{1}{2}$ per cent. On the other hand they have been extended to 7 per cent. They may thus prove acceptable to the public generally, as shewing what annual amount will pay a debt of any kind with interest at highest current rates, and exactly how much of the debt will be paid off each year.

In conclusion I have simply to say that I cordially invite correspondence from Municipal officers, either by way of inquiry or suggestion.

WILLIAM POWIS, F. C. A.

19 Imperial Bank Buildings,
Toronto, Canada.

SINKING FUND TABLE.

Amounts to be set aside and invested yearly, for the following number of years respectively, at any rate of interest from 3 to 6 per cent, in order to produce (\$1,000,000) one million dollars. ^{per} INTEREST EARNED PAYABLE YEARLY.

RATE OF INTEREST.																												
Number of Years.	3		3 $\frac{1}{4}$		3 $\frac{1}{2}$		3 $\frac{3}{4}$		4		4 $\frac{1}{4}$		4 $\frac{1}{2}$		4 $\frac{3}{4}$		5		5 $\frac{1}{4}$		5 $\frac{1}{2}$		5 $\frac{3}{4}$		6			
	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.
5	188354	58	187415	60	186481	38	185551	89	184627	12	183707	03	182791	64	181880	90	180974	80	180073	32	179176	44	178284	14	177396	40	176504	52
6	154597	50	153629	97	152668	21	151712	20	150761	91	149817	31	148878	39	147945	11	147017	47	146095	42	145178	95	144268	03	143362	63	142451	11
7	130506	36	129522	04	128544	50	127573	70	126609	62	125652	21	124701	47	123757	35	122819	82	121888	85	120964	42	120046	49	119135	02	118224	10
8	112456	39	111462	63	110476	65	109498	40	108527	84	107564	93	106609	66	105661	96	104721	82	103789	18	102864	01	101946	28	101035	95	100124	08
9	98433	86	97435	55	96446	01	95465	17	94493	00	93529	44	92574	48	91628	03	90690	08	89760	57	88839	46	87926	70	87022	24	86110	11
10	87230	51	86231	07	85241	37	84261	35	83290	95	82330	12	81378	83	80435	99	79504	58	78581	52	77667	77	76763	27	75867	96	74963	03
15	53766	58	52788	58	51825	08	50875	95	49941	10	49020	43	48113	81	47221	14	46342	29	45477	15	44625	60	43787	52	42962	77	42139	04
20	37215	71	36278	88	35361	08	34462	10	33581	75	32719	84	31876	15	31050	47	30242	59	29452	28	28679	33	27923	50	27184	56	26445	17
25	27427	88	26539	33	25674	04	24831	70	24011	97	23214	53	22439	03	21685	13	20952	46	20240	66	19549	35	18878	17	18226	72	17587	08
30	21019	26	20181	72	19371	34	18587	63	17830	10	17098	25	16391	55	15709	46	15051	44	14416	94	13865	39	13216	24	12648	92	12090	15
40	13262	38	12527	94	11827	29	11159	46	10523	49	9918	39	9343	15	8796	75	8278	16	7786	37	7320	35	6879	07	6461	54	6050	26
50	8865	49	8230	28	7633	71	7074	22	6550	20	6060	05	5602	15	5174	90	4776	74	4406	09	4061	45	3741	33	3444	29	3144	04
60	6132	96	5589	94	5088	63	4626	70	4201	85	3811	78	3454	26	3127	10	2828	19	2555	50	2307	07	2081	07	1875	73	1675	11
70	4336	63	3877	27	3460	96	3084	57	2745	07	2439	52	2165	12	1919	17	1699	16	1502	69	1327	55	1171	67	1033	13	9033	06
75	3667	97	3247	03	2869	20	2530	98	2229	01	1960	05	1721	04	1509	13	1321	61	1156	01	1010	03	881	55	768	67	658	01
80	3111	75	2726	91	2384	89	2081	85	1814	08	1578	12	1370	70	1188	80	1029	63	890	63	769	49	664	09	572	55	462	02
90	2255	56	1936	01	1657	82	1416	46	1207	76	1027	83	873	16	740	55	627	12	530	32	447	89	377	82	318	37	208	07
100	1516	67	1383	51	1159	27	968	95	808	00	672	36	558	40	462	92	383	14	316	64	261	32	215	41	177	36	77	03

For amounts less than a million, the proportion of above figures will give the required sum. Thus, for \$20,000, payable in 30 years, the interest on the sinking fund assumed to be 4¹ per cent, we take \$17,098.25 as that required for \$1,000,000, and dividing by 100 we get \$170.98¹ for \$10,000, which multiplied by 2 gives \$341.96¹, the amount required for \$20,000. In other words, the annual sinking fund given in the above table, multiplied by the amount of the Debentures and divided by 1,000,000 gives the sinking fund required.

It is to be borne in mind that it may be necessary to compute the sinking fund at a lower rate of interest than that paid on the debentures. When it is decided at what rate the sinking fund is to be computed, the above table will, in all cases, show the amounts to be raised annually.

DEBENTURE INSTALMENT TABLES.

SHEWING AMOUNT OF PRINCIPAL TO BE PAID EACH YEAR IN ORDER TO REDUCE TO AN EQUAL SUM THE AMOUNT TO BE LEVIED EACH YEAR FOR PAYMENT OF PRINCIPAL AND INTEREST ON AN ISSUE OF \$1,000,000.

Debentures bearing 4 per cent Interest, Payable in 5 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$40000 00	\$184627 11	\$224627 11
2	32614 92	192012 19	224627 11
3	24934 42	199692 69	224627 11
4	16946 71	207680 40	224627 11
5	8639 50	215987 61	224627 11
		\$1000000 00	

Debentures bearing 4 per cent Interest, Payable in 10 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$40000 00	\$83290 95	\$123290 95
2	36668 37	86622 58	123290 95
3	33203 46	90087 49	123290 95
4	29599 96	93690 99	123290 95
5	25852 33	97438 62	123290 95
6	21954 78	101336 17	123290 95
7	17901 33	105389 62	123290 95
8	13685 75	109605 20	123290 95
9	9301 54	113989 40	123290 94
10	4741 96	118548 98	123290 94
		\$1000000 00	

The figures are given for an issue of \$1,000,000, for the purpose of exhibiting more exact amounts. For amounts less than a million it is only necessary to take the same proportion of above sums, thus :—

\$100,000 requires exactly one-tenth of above figures, viz. : For 5 years,
1st Payment—Interest, \$4000.00 ; Principal, \$18,462.71 ; total, \$22,462.71.
5th Payment—Interest, \$863.95 ; Principal, \$21,598.76 ; total, \$22,462.71.

In cases where the half year's interest has to be paid in advance of the collection of the rate levied, any interest paid on the amount borrowed to meet such payment can, when ascertained, be added to the next following assessment.

Debentures bearing 4 per cent Interest, Payable in 15 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$40000 00	\$49941 10	\$89941 10
2	38002 36	51938 74	89941 10
3	35924 81	54016 30	89941 11
4	33764 16	56176 94	89941 10
5	31517 08	58424 03	89941 11
6	29180 12	60760 98	89941 10
7	26749 68	63191 43	89941 11
8	24222 02	65719 08	89941 10
9	21593 26	68347 85	89941 11
10	18859 34	71081 76	89941 10
11	16016 07	73925 03	89941 10
12	13059 07	76882 03	89941 10
13	9983 79	79957 31	89941 10
14	6785 50	83155 60	89941 10
15	3459 28	86481 82	89941 10
		\$1000000 00	

Debentures bearing 4 per cent Interest, Payable in 20 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$40000 00	\$33581 75	\$73581 75
2	38656 73	34925 02	73581 75
3	37259 73	36322 02	73581 75
4	35806 85	37774 90	73581 75
5	34295 85	39285 90	73581 75
6	32724 41	40857 34	73581 75
7	31090 11	42491 64	73581 75
8	29390 45	44191 30	73581 75
9	27622 81	45958 94	73581 75
10	25784 45	47797 30	73581 75
11	23872 56	49709 19	73581 75
12	21884 19	51697 56	73581 75
13	19816 29	53765 46	73581 75
14	17665 67	55916 08	73581 75
15	15429 03	58152 72	73581 75
16	13102 92	60478 83	73581 75
17	10683 77	62897 98	73581 75
18	8167 85	65413 91	73581 76
19	5551 29	68030 47	73581 76
20	2830 07	70751 69	73581 76
		\$1000000 00	

Debentures bearing 4 per cent Interest, Payable in 25 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$40000 00	\$24011 96	\$64011 96
2	39039 52	24972 44	64011 96
3	38040 62	25971 34	64011 96
4	37001 77	27010 19	64011 96
5	35921 36	28090 60	64011 96
6	34797 74	29214 22	64011 96
7	33629 17	30382 79	64011 96
8	32413 86	31598 10	64011 96
9	31149 94	32862 02	64011 96
10	29835 46	34176 50	64011 96
11	28468 40	35543 56	64011 96
12	27046 66	36965 30	64011 96
13	25568 05	38443 91	64011 96
14	24030 29	39981 67	64011 96
15	22431 01	41580 96	64011 97
16	20767 77	43244 20	64011 97
17	19038 01	44973 96	64011 97
18	17239 05	46772 92	64011 97
19	15368 13	48643 84	64011 97
20	13422 38	50589 59	64011 97
21	11398 79	52613 18	64011 97
22	9294 27	54717 70	64011 97
23	7105 56	56906 41	64011 97
24	4829 30	59182 67	64011 97
25	2462 00	61549 97	64011 97
		\$1000000 00	

Debentures bearing 4 per cent Interest, Payable in 30 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$40000 00	\$17830 10	\$57830 10
2	39286 80	18543 30	57830 10
3	38545 07	19285 03	57830 10
4	37773 66	20056 44	57830 10
5	36971 41	20858 69	57830 10
6	36137 06	21693 04	57830 10
7	35269 34	22560 76	57830 10
8	34366 90	23463 20	57830 10
9	33428 38	24401 72	57830 10
10	32452 31	25377 79	57830 10
11	31437 20	26392 90	57830 10
12	30381 48	27448 62	57830 10
13	29283 54	28546 56	57830 10
14	28141 67	29688 43	57830 10
15	26954 14	30875 96	57830 10
16	25719 10	32111 00	57830 10
17	24434 66	33395 44	57830 10
18	23098 84	34731 26	57830 10
19	21709 59	36120 51	57830 10
20	20264 77	37565 33	57830 10
21	18762 16	39067 94	57830 10
22	17199 44	40630 66	57830 10
23	15574 21	42255 89	57830 10
24	13883 98	43946 12	57830 10
25	12126 13	45703 97	57830 10
26	10297 97	47532 13	57830 10
27	8396 69	49433 41	57830 10
28	6419 35	51410 75	57830 10
29	4362 92	53467 18	57830 10
30	2224 23	55605 87	57830 10
		\$1000000 00	

Debentures bearing 4½ per cent Interest, Payable in 5 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$45000 00	\$182791 64	\$227791 64
2	36774 38	191017 26	227791 64
3	28178 60	199613 04	227791 64
4	19196 01	208595 63	227791 64
5	9809 21	217982 43	227791 64
		\$1000000 00	

Debentures bearing 4½ per cent Interest, Payable in 10 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$45000 00	\$81378 83	\$126378 83
2	41337 95	85040 87	126378 82
3	37511 11	88867 71	126378 82
4	33512 07	92866 75	126378 82
5	29333 06	97045 76	126378 82
6	24966 00	101412 82	126378 82
7	20402 43	105976 39	126378 82
8	15633 49	110745 33	126378 82
9	10649 95	115728 87	126378 82
10	5442 15	120936 67	126378 82
		\$1000000 00	

Debentures bearing $4\frac{1}{2}$ per cent Interest, Payable in 15 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$45000 00	\$48113 81	\$93113 81
2	42834 88	50278 93	93113 81
3	40572 33	52541 48	93113 81
4	38207 96	54905 85	93113 81
5	35737 20	57376 61	93113 81
6	33155 25	59958 56	93113 81
7	30457 12	62656 69	93113 81
8	27637 56	65476 25	93113 81
9	24691 13	68422 68	93113 81
10	21612 11	71501 70	93113 81
11	18394 54	74719 27	93113 81
12	15032 17	78081 64	93113 81
13	11518 50	81595 31	93113 81
14	7846 71	85267 10	93113 81
15	4009 69	89104 12	93113 81
		\$1000000 00	

Debentures bearing $4\frac{1}{2}$ per cent Interest, Payable in 20 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$45000 00	\$31876 15	\$76876 15
2	43565 58	33310 57	76876 15
3	42066 60	34809 55	76876 15
4	40500 17	36375 98	76876 15
5	38863 26	38012 89	76876 15
6	37152 68	39723 47	76876 15
7	35365 12	41511 03	76876 15
8	33497 12	43379 03	76876 15
9	31545 07	45331 08	76876 15
10	29505 17	47370 98	76876 15
11	27373 47	49502 68	76876 15
12	25145 85	51730 30	76876 15
13	22817 99	54058 16	76876 15
14	20385 37	56490 78	76876 15
15	17843 29	59032 86	76876 15
16	15186 81	61689 34	76876 15
17	12410 79	64465 36	76876 15
18	9509 84	67366 31	76876 15
19	6478 36	70397 79	76876 15
20	3310 46	73565 69	76876 15
		\$1000000 00	

Debentures bearing $4\frac{1}{2}$ per cent Interest, Payable in 25 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$45000 00	\$22439 03	\$67439 03
2	43990 25	23448 78	67439 03
3	42935 05	24503 98	67439 03
4	41832 37	25606 66	67439 03
5	40680 07	26758 96	67439 03
6	39475 92	27963 11	67439 03
7	38217 58	29221 45	67439 03
8	36902 61	30536 42	67439 03
9	35528 47	31910 56	67439 03
10	34092 50	33346 53	67439 03
11	32591 91	34847 12	67439 03
12	31023 78	36415 25	67439 03
13	29385 10	38053 93	67439 03
14	27672 67	39766 36	67439 03
15	25883 19	41555 84	67439 03
16	24013 17	43425 86	67439 03
17	22059 01	45380 02	67439 03
18	20016 91	47422 12	67439 03
19	17882 91	49556 12	67439 03
20	15652 89	51786 14	67439 03
21	13322 51	54116 52	67439 03
22	10887 27	56551 76	67439 03
23	8342 44	59096 59	67439 03
24	5683 09	61755 94	67439 03
25	2904 08	64534 95	67439 03
		\$1000000.00	

Debentures bearing 4½ per cent Interest, Payable in 30 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$45000 00	\$16391 55	\$61391 55
2	44262 39	17129 16	61391 55
3	43491 57	17899 98	61391 55
4	42686 07	18705 48	61391 55
5	41844 33	19547 22	61391 55
6	40964 71	20426 84	61391 55
7	40045 50	21346 05	61391 55
8	39084 93	22306 62	61391 55
9	38081 13	23310 42	61391 55
10	37032 16	24359 39	61391 55
11	35935 99	25455 56	61391 55
12	34790 49	26601 06	61391 55
13	33593 44	27798 11	61391 55
14	32342 52	29049 03	61391 55
15	31035 32	30356 23	61391 55
16	29669 29	31722 26	61391 55
17	28241 78	33149 77	61391 55
18	26750 04	34641 51	61391 55
19	25191 18	36200 37	61391 55
20	23562 16	37829 39	61391 55
21	21859 83	39531 72	61391 55
22	20080 91	41310 64	61391 55
23	18221 93	43169 62	61391 55
24	16279 30	45112 25	61391 55
25	14249 24	47142 31	61391 55
26	12127 84	49263 71	61391 55
27	9910 97	51480 58	61391 55
28	7594 35	53797 20	61391 55
29	5173 47	56218 08	61391 55
30	2643 66	58747 89	61391 55
		\$1000000 00	

Debentures bearing 5 per cent Interest, Payable in 5 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$50000 00	\$180974 80	\$230974 80
2	40951 26	190023 54	230974 80
3	31450 09	199524 71	230974 80
4	21473 85	209500 95	230974 80
5	10998 80	219976 00	230974 80
		\$1000000 00	

Debentures bearing 5 per cent Interest, Payable in 10 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$50000 00	\$79504 58	\$129504 58
2	46024 77	83479 81	129504 58
3	41850 78	87653 80	129504 58
4	37468 09	92036 49	129504 58
5	32866 27	96638 31	129504 58
6	28034 35	101470 22	129504 57
7	22960 84	106543 73	129504 57
8	17633 65	111870 92	129504 57
9	12040 11	117464 46	129504 57
10	6166 89	123337 68	129504 57
		\$1000000 00	

Debentures bearing 5 per cent Interest, Payable in 15 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$50000 00	\$46342 29	\$96342 29
2	47682 89	48659 40	96342 29
3	45249 92	51092 37	96342 29
4	42695 30	53646 99	96342 29
5	40012 95	56329 34	96342 29
6	37196 48	59145 81	96342 29
7	34239 19	62103 10	96342 29
8	31134 04	65208 25	96342 29
9	27873 63	68468 66	96342 29
10	24450 19	71892 10	96342 29
11	20855 59	75486 70	96342 29
12	17081 25	79261 04	96342 29
13	13118 20	83224 09	96342 29
14	8956 99	87385 30	96342 29
15	4587 73	91754 56	96342 29
		\$1000000 00	

Debentures bearing 5 per cent Interest, Payable in 20 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$50000 00	\$30242 59	\$80242 59
2	48487 87	31754 72	80242 59
3	46900 14	33342 45	80242 59
4	45233 02	35009 57	80242 59
5	43482 54	36760 05	80242 59
6	41644 53	38598 06	80242 59
7	39714 63	40527 96	80242 59
8	37688 23	42554 36	80242 59
9	35560 52	44682 07	80242 59
10	33326 41	46916 18	80242 59
11	30980 60	49261 99	80242 59
12	28517 50	51725 09	80242 59
13	25931 25	54311 34	80242 59
14	23215 68	57026 91	80242 59
15	20364 34	59878 25	80242 59
16	17370 42	62872 17	80242 59
17	14226 81	66015 78	80242 59
18	10926 03	69316 56	80242 59
19	7460 20	72782 39	80242 59
20	3821 08	76421 51	80242 59
		\$1000000 00	

Debentures bearing 5 per cent Interest, Payable in 25 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$50000 00	\$20952 46	\$70952 46
2	48952 38	22000 08	70952 46
3	47852 38	23100 08	70952 46
4	46697 37	24255 09	70952 46
5	45484 62	25467 84	70952 46
6	44211 23	26741 23	70952 46
7	42874 16	28078 30	70952 46
8	41470 25	29482 21	70952 46
9	39996 14	30956 32	70952 46
10	38448 32	32504 14	70952 46
11	36823 11	34129 35	70952 46
12	35116 65	35835 81	70952 46
13	33324 86	37627 60	70952 46
14	31443 48	39508 98	70952 46
15	29468 03	41484 43	70952 46
16	27393 81	43558 65	70952 46
17	25215 87	45736 59	70952 46
18	22929 04	48023 42	70952 46
19	20527 87	50424 59	70952 46
20	18006 64	52945 82	70952 46
21	15359 35	55593 11	70952 46
22	12579 70	58372 76	70952 46
23	9661 06	61291 40	70952 46
24	6596 49	64355 97	70952 46
25	3378 69	67573 77	70952 46
		\$1000000 00	

Debentures bearing 5 per cent Interest, Payable in 30 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$50000 00	\$15051 44	\$65051 44
2	49247 43	15804 01	65051 44
3	48457 23	16594 21	65051 44
4	47627 52	17423 92	65051 44
5	46756 33	18295 11	65051 44
6	45841 57	19209 87	65051 44
7	44881 08	20170 36	65051 44
8	43872 56	21178 88	65051 44
9	42813 61	22237 83	65051 44
10	41701 72	23349 72	65051 44
11	40534 24	24517 20	65051 44
12	39308 38	25743 06	65051 44
13	38021 22	27030 22	65051 44
14	36669 72	28381 72	65051 44
15	35250 63	29800 81	65051 44
16	33760 59	31290 85	65051 44
17	32196 05	32855 39	65051 44
18	30553 28	34498 16	65051 44
19	28828 37	36223 07	65051 44
20	27017 21	38034 23	65051 44
21	25115 50	39935 94	65051 44
22	23118 71	41932 73	65051 44
23	21022 07	44029 37	65051 44
24	18820 60	46230 84	65051 44
25	16509 06	48542 38	65051 44
26	14081 94	50969 50	65051 44
27	11533 46	53517 98	65051 44
28	8857 56	56193 88	65051 44
29	6047 87	59003 57	65051 44
30	3097 69	61953 75	65051 44
		\$1000000 00	

Debentures bearing 5½ per cent Interest, Payable in 5 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$55000 00	\$179176 44	\$234176 44
2	45145 30	189031 14	234176 44
3	34748 59	199427 85	234176 44
4	23780 06	210396 38	234176 44
5	12208 25	221968 19	234176 44
		\$1000000 00	

Debentures bearing 5½ per cent Interest, Payable in 10 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$55000 00	\$77667 77	\$132667 77
2	50728 28	81939 49	132667 77
3	46221 60	86446 17	132667 77
4	41467 06	91200 71	132667 77
5	36451 02	96216 75	132667 77
6	31159 10	101508 67	132667 77
7	25576 13	107091 64	132667 77
8	19686 09	112981 68	132667 77
9	13472 09	119195 68	132667 77
10	6916 33	125751 44	132667 77
		\$1000000 00	

Debentures bearing $5\frac{1}{2}$ per cent Interest, Payable in 15 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$55000 00	\$44625 60	\$99625 60
2	52545 60	47080 00	99625 60
3	49956 19	49669 41	99625 60
4	47224 38	52401 22	99625 60
5	44342 31	55283 29	99625 60
6	41301 73	58323 87	99625 60
7	38093 92	61531 68	99625 60
8	34709 67	64915 93	99625 60
9	31139 30	68486 30	99625 60
10	27372 55	72253 05	99625 60
11	23398 63	76226 97	99625 60
12	19206 15	80419 45	99625 60
13	14783 08	84842 52	99625 60
14	10116 74	89508 86	99625 60
15	5193 75	94431 85	99625 60
		\$1000000 00	

Debentures bearing $5\frac{1}{2}$ per cent Interest, Payable in 20 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$55000 00	\$28679 33	\$83679 33
2	53422 64	30256 69	83679 33
3	51758 52	31920 81	83679 33
4	50002 87	33676 46	83679 33
5	48150 67	35528 66	83679 33
6	46196 59	37482 74	83679 33
7	44135 04	39544 29	83679 33
8	41960 11	41719 22	83679 33
9	39665 55	44013 78	83679 33
10	37244 79	46434 54	83679 33
11	34690 89	48988 44	83679 33
12	31996 53	51682 80	83679 33
13	29153 97	54525 36	83679 33
14	26155 08	57524 25	83679 33
15	22991 25	60688 08	83679 33
16	19653 40	64025 93	83679 33
17	16131 97	67547 36	83679 33
18	12416 87	71262 46	83679 33
19	8497 43	75181 90	83679 33
20	4362 43	79316 90	83679 33
		\$1000000 00	

Debentures bearing $5\frac{1}{2}$ per cent Interest, Payable in 25 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$55000 00	\$19549 36	\$74549 36
2	53924 79	20624 57	74549 36
3	52790 44	21758 92	74549 36
4	51593 70	22955 66	74549 36
5	50331 14	24218 22	74549 36
6	48999 14	25550 22	74549 36
7	47593 87	26955 49	74549 36
8	46111 32	28438 04	74549 36
9	44547 23	30002 13	74549 36
10	42897 11	31652 25	74549 36
11	41156 24	33393 12	74549 36
12	39319 62	35229 74	74549 36
13	37381 98	37167 38	74549 36
14	35337 78	39211 58	74549 36
15	33181 14	41368 22	74549 36
16	30905 89	43643 47	74549 36
17	28505 50	46043 86	74549 36
18	25973 08	48576 28	74549 36
19	23301 39	51247 97	74549 36
20	20482 75	54066 61	74549 36
21	17509 09	57040 26	74549 35
22	14371 87	60177 48	74549 35
23	11062 11	63487 24	74549 35
24	7570 31	66979 04	74549 35
25	3886 46	70662 89	74549 35
		\$1000000 00	

Debentures bearing 5½ per cent Interest, Payable in 30 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$55000 00	\$13805 39	\$68805 39
2	54240 70	14564 69	68805 39
3	53439 65	15365 74	68805 39
4	52594 53	16210 86	68805 39
5	51702 93	17102 46	68805 39
6	50762 30	18043 09	68805 39
7	49769 93	19035 46	68805 39
8	48722 98	20082 41	68805 39
9	47618 44	21186 95	68805 39
10	46453 16	22352 23	68805 39
11	45223 79	23581 60	68805 39
12	43926 80	24878 59	68805 39
13	42558 48	26246 91	68805 39
14	41114 90	27690 49	68805 39
15	39591 92	29213 47	68805 39
16	37985 18	30820 21	68805 39
17	36290 07	32515 32	68805 39
18	34501 73	34303 66	68805 39
19	32615 03	36190 36	68805 39
20	30624 56	38180 83	68805 39
21	28524 61	40280 78	68805 39
22	26309 17	42496 22	68805 39
23	23971 88	44833 51	68805 39
24	21506 03	47299 36	68805 39
25	18904 57	49900 82	68805 39
26	16160 02	52645 37	68805 39
27	13264 53	55540 86	68805 39
28	10209 78	58595 61	68805 39
29	6987 02	61818 37	68805 39
30	3587 01	65218 38	68805 39
		\$1000000 00	

Debentures bearing 6 per cent Interest, Payable in 5 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$60000 00	\$177396 40	\$237396 40
2	49356 22	188040 18	237396 40
3	38073 80	199322 60	237396 40
4	26114 45	211281 95	237396 40
5	13437 53	223958 87	237396 40
		\$1000000 00	

Debentures bearing 6 per cent Interest, Payable in 10 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$60000 00	\$75867 96	\$135867 96
2	55447 93	80420 03	135867 96
3	50622 72	85245 24	135867 96
4	45508 01	90359 95	135867 96
5	40086 41	95781 55	135867 96
6	34339 52	101528 44	135867 96
7	28247 81	107620 15	135867 96
8	21790 60	114077 36	135867 96
9	14945 96	120922 00	135867 96
10	7690 64	128177 32	135867 96
		\$1000000 00	

Debentures bearing 6 per cent Interest, Payable in 15 Yearly Instalments.

Each Year	Interest.	Principal.	Total Annual Amount.
1	\$60000 00	\$42962 77	\$102962 77
2	57422 24	45540 53	102962 77
3	54689 81	48272 96	102962 77
4	51793 43	51169 34	102962 77
5	48723 27	54239 50	102962 77
6	45468 90	57493 87	102962 77
7	42019 27	60943 50	102962 77
8	38362 66	64600 11	102962 77
9	34486 65	68476 12	102962 77
10	30378 08	72584 69	102962 77
11	26023 00	76939 77	102962 77
12	21406 62	81556 15	102962 77
13	16513 25	86449 52	102962 77
14	11326 28	91636 49	102962 77
15	5828 09	97134 68	102962 77
		\$1000000 00	

Debentures bearing 6 per cent Interest, Payable in 20 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$60000 00	\$27184 56	\$87184 56
2	58368 93	28815 63	87184 56
3	56639 99	30544 57	87184 56
4	54807 32	32377 24	87184 56
5	52864 68	34319 88	87184 56
6	50805 49	36379 07	87184 56
7	48622 75	38561 81	87184 56
8	46309 04	40875 52	87184 56
9	43856 51	43328 05	87184 56
10	41256 82	45927 74	87184 56
11	38501 16	48683 40	87184 56
12	35580 15	51604 41	87184 56
13	32483 89	54700 67	87184 56
14	29201 85	57982 71	87184 56
15	25722 89	61461 67	87184 56
16	22035 19	65149 37	87184 56
17	18126 22	69058 34	87184 56
18	13982 72	73201 84	87184 56
19	9590 62	77593 94	87184 56
20	4934 98	82249 58	87184 56
		\$1000000 00	

Debentures bearing 6 per cent Interest, Payable in 25 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$60000 00	\$18226 72	\$78226 72
2	58906 40	19320 32	78226 72
3	57747 18	20479 54	78226 72
4	56518 41	21708 31	78226 72
5	55215 91	23010 81	78226 72
6	53835 26	24391 46	78226 72
7	52371 77	25854 95	78226 72
8	50820 48	27406 24	78226 72
9	49176 10	29050 62	78226 72
10	47433 06	30793 66	78226 72
11	45585 44	32641 28	78226 72
12	43626 97	34599 75	78226 72
13	41550 98	36675 74	78226 72
14	39350 44	38876 28	78226 72
15	37017 86	41208 86	78226 72
16	34545 33	43681 39	78226 72
17	31924 45	46302 27	78226 72
18	29146 31	49080 41	78226 72
19	26201 48	52025 24	78226 72
20	23079 97	55146 75	78226 72
21	19771 16	58455 56	78226 72
22	16263 83	61962 89	78226 72
23	12546 06	65680 66	78226 72
24	8605 22	69621 50	78226 72
25	4427 93	73798 79	78226 72
		\$1000000 00	

Debentures bearing 6 per cent Interest, Payable in 30 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$60000 00	\$12648 91	\$72648 91
2	59241 07	13407 84	72648 91
3	58436 60	14212 31	72648 91
4	57583 86	15065 05	72648 91
5	56679 96	15968 95	72648 91
6	55721 82	16927 09	72648 91
7	54706 20	17942 71	72648 91
8	53629 63	19019 29	72648 92
9	52488 48	20160 44	72648 92
10	51278 85	21370 07	72648 92
11	49996 65	22652 27	72648 92
12	48637 51	24011 41	72648 92
13	47196 82	25452 10	72648 92
14	45669 70	26979 22	72648 92
15	44050 94	28597 98	72648 92
16	42335 07	30313 85	72648 92
17	40516 23	32132 69	72648 92
18	38588 27	34060 65	72648 92
19	36544 64	36104 28	72648 92
20	34378 38	38270 54	72648 92
21	32082 15	40566 77	72648 92
22	29648 14	43000 78	72648 92
23	27068 09	45580 83	72648 92
24	24333 24	48315 68	72648 92
25	21434 30	51214 62	72648 92
26	18361 42	54287 50	72648 92
27	15104 17	57544 75	72648 92
28	11651 49	60997 43	72648 92
29	7991 64	64657 28	72648 92
30	4112 21	68536 71	72648 92
		\$1000000 00	

Debentures bearing 6½ per cent Interest, Payable in 5 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$65000 00	\$175634 54	\$240634 54
2	53583 76	187050 78	240634 54
3	41425 45	199209 09	240634 54
4	28476 87	212157 67	240634 54
5	14686 62	225947 92	240634 54
		\$1000000 00	

Debentures bearing 6½ per cent Interest, Payable in 10 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$65000 00	\$74104 69	\$139104 69
2	60183 19	78921 50	139104 69
3	55053 30	84051 39	139104 69
4	49589 96	89514 73	139104 69
5	43771 50	95333 19	139104 69
6	37574 84	101529 85	139104 69
7	30975 40	108129 29	139104 69
8	23947 00	115157 69	139104 69
9	16461 75	122642 94	139104 69
10	8489 96	130614 73	139104 69
		\$1000000 00	

Debentures bearing 6½ per cent Interest, Payable in 15 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$65000 00	\$41352 78	\$106352 78
2	62312 07	44040 71	106352 78
3	59449 42	46903 36	106352 78
4	56400 70	49952 08	106352 78
5	53153 82	53198 96	106352 78
6	49695 89	56656 89	106352 78
7	46013 19	60339 59	106352 78
8	42091 11	64261 67	106352 78
9	37914 10	68438 68	106352 78
10	33465 59	72887 19	106352 78
11	28727 92	77624 86	106352 78
12	23682 30	82670 48	106352 78
13	18308 72	88044 06	106352 78
14	12585 86	93766 92	106352 78
15	6491 01	99861 77	106352 78
		\$1000000 00	

Debentures bearing 6½ per cent Interest, Payable in 20 yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$65000 00	\$25756 40	\$90756 40
2	63325 84	27430 56	90756 40
3	61542 85	29213 55	90756 40
4	59643 97	31112 43	90756 40
5	57621 66	33134 74	90756 40
6	55467 90	35288 50	90756 40
7	53174 15	37582 25	90756 40
8	50731 31	40025 09	90756 40
9	48129 68	42626 72	90756 40
10	45358 94	45397 46	90756 40
11	42408 10	48348 30	90756 40
12	39265 47	51490 93	90756 40
13	35918 56	54837 84	90756 40
14	32354 10	58402 30	90756 40
15	28557 95	62198 45	90756 40
16	24515 05	66241 35	90756 40
17	20209 36	70547 04	90756 40
18	15623 80	75132 60	90756 40
19	10740 18	80016 22	90756 40
20	5539 13	85217 27	90756 40
		\$1000000 00	

Debentures bearing 6½ per cent Interest, Payable in 25 yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$65000 00	\$16981 49	\$81981 49
2	63896 21	18085 28	81981 49
3	62720 67	19260 82	81981 49
4	61468 71	20512 78	81981 49
5	60135 38	21846 11	81981 49
6	58715 39	23266 10	81981 49
7	57203 09	24778 40	81981 49
8	55592 49	26389 00	81981 49
9	53877 21	28104 28	81981 49
10	52050 43	29931 06	81981 49
11	50104 91	31876 58	81981 49
12	48032 93	33948 56	81981 49
13	45826 28	36155 21	81981 49
14	43476 19	38505 29	81981 48
15	40973 34	41008 14	81981 48
16	38307 81	43673 67	81981 48
17	35469 03	46512 45	81981 48
18	32445 72	49535 76	81981 48
19	29225 89	52755 59	81981 48
20	25796 78	56184 70	81981 48
21	22144 77	59836 71	81981 48
22	18255 39	63726 09	81981 48
23	14113 19	67868 29	81981 48
24	9701 75	72279 73	81981 48
25	5003 57	76977 91	81981 48
		\$1000000 00	

Debentures bearing 6½ per cent Interest, Payable in 30 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$65000 00	\$11577 45	\$76577 45
2	64247 47	12329 98	76577 45
3	63446 02	13131 43	76577 45
4	62592 48	13984 97	76577 45
5	61683 46	14893 99	76577 45
6	60715 35	15862 10	76577 45
7	59684 31	16893 14	76577 45
8	58586 26	17991 19	76577 45
9	57416 83	19160 62	76577 45
10	56171 39	20406 06	76577 45
11	54844 99	21732 46	76577 45
12	53432 38	23145 07	76577 45
13	51927 95	24649 50	76577 45
14	50325 74	26251 70	76577 44
15	48619 38	27958 06	76577 44
16	46802 10	29775 34	76577 44
17	44866 70	31710 74	76577 44
18	42805 51	33771 93	76577 44
19	40610 33	35967 11	76577 44
20	38272 47	38304 97	76577 44
21	35782 65	40794 79	76577 44
22	33130 98	43446 46	76577 44
23	30306 97	46270 47	76577 44
24	27299 38	49278 06	76577 44
25	24096 31	52481 13	76577 44
26	20685 04	55892 40	76577 44
27	17052 03	59525 41	76577 44
28	13182 88	63394 56	76577 44
29	9062 23	67515 21	76577 44
30	4673 74	71903 70	76577 44
		\$1000000 00	

Debentures bearing 7 per cent Interest, Payable in 5 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$70000 00	\$173890 70	\$243890 70
2	57827 66	186063 04	243890 70
3	44803 24	199087 46	243890 70
4	30867 12	213023 58	243890 70
5	15955 47	227935 22	243890 69
		\$1000000 00	

Debentures bearing 7 per cent Interest, Payable in 10 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$70000 00	\$72377 51	\$142377 51
2	64933 58	77443 93	142377 51
3	59512 50	82865 01	142377 51
4	53711 95	88665 56	142377 51
5	47505 36	94872 14	142377 50
6	40864 31	101513 19	142377 50
7	33758 39	108619 11	142377 50
8	26155 05	116222 45	142377 50
9	18019 48	124358 02	142377 50
10	9314 42	133063 08	142377 50
		\$1000000 00	

Debentures bearing 7 per cent Interest, Payable in 15 Yearly Instalments.

Each Year.	Interest.	Principal	Total Annual Amount.
1	\$70000 00	\$39794 63	\$109794 63
2	67214 38	42580 25	109794 63
3	64233 76	45560 87	109794 63
4	61044 50	48750 13	109794 63
5	57631 99	52162 64	109794 63
6	53980 61	55814 02	109794 63
7	50073 63	59721 00	109794 63
8	45893 16	63901 47	109794 63
9	41420 05	68374 58	109794 63
10	36633 83	73160 80	109794 63
11	31512 58	78282 05	109794 63
12	26032 83	83761 79	109794 62
13	20169 51	89625 11	109794 62
14	13895 75	95898 87	109794 62
15	7182 83	102611 79	109794 62
		\$1000000 00	

Debentures bearing 7 per cent Interest, Payable in 20 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$70000 00	\$24392 93	\$94392 93
2	68292 50	26100 43	94392 93
3	66465 47	27927 46	94392 93
4	64510 55	29882 38	94392 93
5	62418 78	31974 15	94392 93
6	60180 59	34212 34	94392 93
7	57785 73	36607 20	94392 93
8	55223 22	39169 71	94392 93
9	52481 34	41911 59	94392 93
10	49547 53	44845 40	94392 93
11	46408 35	47984 58	94392 93
12	43049 43	51343 50	94392 93
13	39455 39	54937 54	94392 93
14	35609 76	58783 17	94392 93
15	31494 94	62897 99	94392 93
16	27092 08	67300 85	94392 93
17	22381 02	72011 91	94392 93
18	17340 19	77052 74	94392 93
19	11946 49	82446 44	94392 93
20	6175 24	88217 69	94392 93
		\$1000000 00	

Debentures bearing 7 per cent Interest, Payable in 25 Yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$70000 00	\$15810 52	\$85810 52
2	68893 27	16917 25	85810 52
3	67709 06	18101 46	85810 52
4	66441 96	19368 56	85810 52
5	65086 16	20724 36	85810 52
6	63635 45	22175 07	85810 52
7	62083 20	23727 32	85810 52
8	60422 29	25388 23	85810 52
9	58645 11	27165 41	85810 52
10	56743 53	29066 99	85810 52
11	54708 84	31101 68	85810 52
12	52531 72	33278 80	85810 52
13	50202 21	35608 31	85810 52
14	47709 63	38100 89	85810 52
15	45042 56	40767 96	85810 52
16	42188 81	43621 71	85810 52
17	39135 29	46675 23	85810 52
18	35868 02	49942 50	85810 52
19	32372 05	53438 47	85810 52
20	28631 35	57179 18	85810 53
21	24628 81	61181 72	85810 53
22	20346 09	65464 44	85810 53
23	15763 58	70046 95	85810 53
24	10860 29	74950 24	85810 53
25	5613 78	80196 75	85810 53
		\$1000000 00	

Debentures bearing 7 per cent Interest, Payable in 30 yearly Instalments.

Each Year.	Interest.	Principal.	Total Annual Amount.
1	\$70000 00	\$10586 40	\$80586 40
2	69258 96	11327 45	80586 41
3	68466 04	12120 37	80586 41
4	67617 61	12968 80	80586 41
5	66709 79	13876 62	80586 41
6	65738 43	14847 98	80586 41
7	64699 07	15887 34	80586 41
8	63586 96	16999 45	80586 41
9	62397 00	18189 41	80586 41
10	61123 74	19462 67	80586 41
11	59761 35	20825 06	80586 41
12	58303 60	22282 81	80586 41
13	56743 80	23842 61	80586 41
14	55074 82	25511 59	80586 41
15	53289 01	27297 40	80586 41
16	51378 19	29208 22	80586 41
17	49333 61	31252 80	80586 41
18	47145 92	33440 49	80586 41
19	44805 08	35781 33	80586 41
20	42300 39	38286 02	80586 41
21	39620 37	40966 04	80586 41
22	36752 74	43833 67	80586 41
23	33684 39	46902 02	80586 41
24	30401 25	50185 16	80586 41
25	26888 29	53698 12	80586 41
26	23129 42	57456 99	80586 41
27	19107 43	61478 98	80586 41
28	14803 90	65782 51	80586 41
29	10199 12	70387 29	80586 41
30	5272 01	75314 40	80586 41
		\$1000000 00	

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WILLIAM POWIS, F.C.A.,
(Consulting Actuary)

19 Imperial Bank Buildings,
Toronto, Canada.



